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(54) Method and device for the manufacture of a nail plate

Verfahren und Vorrichtung zur Herstellung einer Nagelplatte

Procédé et dispositif pour la fabrication d'une plaque de clou

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(56) References cited:
DE-A- 3 518 811

• SOVIET INVENTIONS ILLUSTRATED Week 8632,
22-08-1986 Derwent Publications Ltd., London
GB & SU-A-1201449

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Description

The invention relates to a method of manufacturing a nailing connector comprising a plate and at least one elongate element attached to and protruding from said plate by welding said element and plate together at a contact point by heating said element and plate sufficiently to effect melting of materials thereof at said contact point.

Such a nail element serves for fastening together nailable building components such as wooden parts, frames, etc. A known nail element is formed, for example, from a plate, from which plate the elongate elements are obtained by partially stamping them out and bending them until they are at an angle relative to the face of the plate. Depending on their intended use, these nails may point from one or two sides of the plate. As the occasion arises the plate may be provided with a recess round its middle.

There is a nail element known from German patent publication DE-A-3 518 811 whereby the elongate elements are welded in place on both sides of a flat plate. With the invention it is now intended to manufacture in a simpler and less expensive manner the nail element proposed in accordance with that German patent publication.

To this end the method in accordance with one embodiment of the invention is distinguished by the steps of:

feeding a strip of said plate material to a welding station at which said welding is effected;
spacing a plurality of said elements along a length of, and in contact with, said strip whilst positioning an element contact point, along a length of said element, in contact with said plate such that said element extends at an angle to, and from opposite faces of, said plate; and
cutting said strip to define a length of said plate.

In an other embodiment the method is distinguished by

feeding at least one strand of element material from which a plurality of said elements is formed, with a leading end of said strand being a leading end of each element, in turn;
cutting and forming a trailing end of each said elements simultaneously with cutting and forming a leading end of a next of said elements, and positioning an element contact point, along a length of said element, in contact with said plate such that said element extends at an angle to, and from opposite faces of, said plate, before or after said cutting step.

The elongate elements may then be welded to the lateral edge of the plate and, if the plate is provided with the recess referred to above, be connected to the lateral

edge of this recess at the same time.

Moreover, with the proposed method just one weld is required per elongate element in order to connect to the plate two nails projecting from both sides of the plate. In a particularly simple embodiment the heat required for bringing about the joint may be generated by electric resistance welding by establishing an electric circuit via the elongate element and the plate.

The invention also relates to a nail element that is obtained by means of the method in accordance with the invention. This nail element differs from the nail element known from DE-A-3 518 811 in that at least one elongate element is placed by a point between its ends against an edge of the plate-shaped element. In particular the lateral edge of the plate-shaped body is concerned here and in a further embodiment a connection to the edge of a recess which may be provided round the middle of the plate-shaped body.

The ends of the elongate element facing away from the plate-shaped body are bevelled. This bevelling ensures that the elongate element bends as it is forced into the nailable material, so that a greater adhesion may be brought about.

The above and other characteristics are evident from the following description using Figures of two example embodiments.

In the drawing:

Figures 1 and 2 each show a perspective top view of a method for the manufacture of a nail element in accordance with the invention.

In the Figures the number (1) indicates the plate-shaped body that is obtained in both embodiments of Figs. 1 and 2 from a long flow of weldable material, for example metal, that is wound off a reel (2). Coiling off takes place by leading the strip through the pinch of a pair of rollers (3) driven by a means of drive not shown in the drawing in order to advance the strip in the direction of arrow P1.

A number of elongate elements are kept stored upright in a pair of holders (4) whereby an end part (6) of the U-shaped holder (4) lies close to the lateral edge (7) of the strip (1). By separating and feeding an elongate element (5) towards the lateral edge (7) of the strip (1), a point of the elongate element (5) may be melted in position onto the lateral edge of the strip (1) by connecting an electric circuit (8). To this end an electric circuit is formed by a source of power (9) which is connected on one hand by the conductors (10) to a elongate element (5) and on the other to the lateral edge (7) of the strip (1). By moving the strip (1) each time in stages over a pass distance (a), the above process may be repeated on one or two edges of the strip (1) so that a strip with nail elements is created as shown to the right of Fig. 1. By cutting the strip (1) to length, elements are obtained which are suitable for fastening together nailable elements, for example wooden building components.

It should be noted that the ends of the elongate ele-

ments (5) are bevelled, whereby the face of the beveling may be made as required and depends on the desired attachment of the nailable building components. The beveling ensures a deviation in the initial position of the elongate elements (5) relative to the plate-shaped body (1) as they are driven into the nailable material. Naturally, the end of each elongate element may also be pointed just like a normal nail.

It is also possible for the elongate elements (5) to be composed of a split element whereby the split face runs through the centre of the element (5) so that, as it is driven into the nailable material, the element will tend to yield which likewise improves the adhesion.

Fig. 2 shows an alternative embodiment for the manufacture of a nail element in accordance with the invention. Here the elongate elements are not fed in via a holder (4) but rather they are obtained from a longer wire (11) which is wound off a reel (12). Cutting through (see arrow 13) the underside of wire (11) creates a elongate element (5) that may be welded in the same manner as in Fig. 1 to the lateral edge (7) of the strip (1). A wire (11) may also be wound off a reel (12'), whereby, every time the wire is cut through, the elongate element (5') is placed on the top of the strip and welded in place by means of an electric circuit. This positioning is of itself known from DE-A-3 518 811. The length of this elongate element (5') may be equal to the half of the elongate element (5) or greater or smaller. Furthermore in accordance with the invention it is possible to apply plate-shaped material that is provided with recesses near the middle of the plate-shaped material in each case at pass distances a. Anyway this is not further shown in the figure. The elongate element (5') which is wound off reel (12') may then in analogous manner as the elongate elements (5) which are wound off reel (12), be welded in place against the edge of the recess (not shown) in such a way that the relevant elongate element (5') projects on both sides of the plate-shaped body (1). This prevents a welded joint from having to be applied on both sides of the plate-shaped body for the same functionality. Cutting through following arrow (13) may take place once again at an incline so that the desired bending off takes place when driven into the nailable material. The final nail element is finished off by cutting off in a cutting direction (15), here by means of a fixed bottom knife (16) and a top knife (18) moved by a cylinder (17). The length of the plate-shaped organ is dependent on the intended use.

It will be clear that the lengths of the plate-shaped bodies may differ from one another and that the pass may be varied between the elongate elements during the feed-through process.

It is likewise possible for one or more ridges to be made in the plate-shaped body by way of reinforcement after being wound off the reel.

Although the above embodiment relates to the manufacture of a nail element from metal, it may also be manufactured from other materials, for example plastics.

The invention is not limited to the embodiment described above.

Claims

1. A method of manufacturing a nailing connector comprising a plate (1) and at least one elongate element (5) attached to and protruding from said plate (1) by welding said element (5) and plate (1) together at a contact point by heating said element and plate sufficiently to effect melting of materials thereof at said contact point, wherein said plate (1) is made from a plate material, characterized by the steps of:

feeding a strip of said plate material to a welding station (9) at which said welding is effected; spacing a plurality of said elements (5) along a length of, and in contact with, said strip whilst positioning an element contact point, along a length of said element, in contact with said plate such that said element extends at an angle to, and from opposite faces of, said plate; and cutting (18) said strip to define a length of said plate.

2. A method of manufacturing a nailing connector comprising a plate (1) and at least one elongate element (5) attached to and protruding from said plate (1) by welding said element (5) and plate (1) together at a contact point by heating said element and plate sufficiently to effect melting of materials thereof at said contact point, characterized by the steps of:

feeding at least one strand (11) of element material from which a plurality of said elements (5) is formed, with a leading end of said strand being a leading end of each element, in turn; cutting (13) and forming a trailing end of each said elements simultaneously with cutting and forming a leading end of a next of said elements, and positioning an element contact point, along a length of said element, in contact with said plate such that said element extends at an angle to, and from opposite faces of, said plate, before or after said cutting step.

3. A method as in claim 1 or 2, characterized by the step of effecting said contact between said element (5) contact point and said plate (1) at a lateral edge (7) of said plate.
4. A method as in claim 1 and/or 2, characterized by the steps of:

providing a recess through said plate; and

effecting said contact between said element contact point and said plate at a lateral edge of said recess.

5. A method as in claim 1-4, characterized by the step of passing an electric current (8, 9, 10) through said element and said plate at said contact point in order to effect said welding.
6. A nailing connector comprising a plate (1) and at least one elongate element (5) attached to said plate (1), as manufactured according to claim 1 or 2, characterized in that at least one elongate element (5) is placed at a point between its ends against an edge of the plate (1), wherein the end or each end of the elongate element (5) is bevelled asymmetrically.

Patentansprüche

1. Verfahren zum Herstellen eines Nagelverbinders, mit einer Platte (1) und zumindest einem langgestreckten Element (5), das durch Zusammenschweißen des Elements (5) und der Platte (1) an einer Kontaktstelle durch ausreichendes Erhitzen des Elements und der Platte, um das Schmelzen von deren Materialien an der Kontaktstelle zu bewirken, an der Platte (1) befestigt wird und von dieser vorsteht, wobei die Platte (1) aus einem Plattenmaterial hergestellt ist, **gekennzeichnet durch folgende Schritte:**
 - ein Streifen des Plattenmaterials wird einer Schweißstation (9) zugeführt, an welcher das Schweißen bewirkt wird;
 - eine Mehrzahl der Elemente (5) wird entlang einer Länge des Streifens und in Kontakt mit diesem im Abstand voneinander angeordnet, während eine Elementenkontaktstelle entlang einer Länge des Elements an der Platte zum Kontakt derart positioniert wird, daß das Element in einem Winkel zu der Platte und von einander gegenüberliegenden Oberflächen derselben sich erstreckt; und
 - der Streifen wird geschnitten, um eine Länge der Platte zu bestimmen.
2. Verfahren zum Herstellen eines Nagelverbinders, mit einer Platte (1) und zumindest einem langgestreckten Element (5), das durch Zusammenschweißen des Elements (5) und der Platte (1) an einer Kontaktstelle durch ausreichendes Erhitzen des Elements und der Platte, um das Schmelzen von deren Materialien an der Kontaktstelle zu bewirken, an der Platte (1) befestigt wird und von dieser vorsteht, **gekennzeichnet durch folgende Schritte:**

zumindest ein Strang (11) von Elementenma-

terial wird zugeführt, von welchem eine Mehrzahl der Elemente (5) gebildet wird, wobei ein vorlaufendes Ende des Strangs seinerseits ein vorlaufendes Ende des jeweiligen Elementes ist;

ein nachlaufendes Ende der jeweiligen Elemente wird gleichzeitig mit dem Schneiden und Formen eines vorlaufenden Endes eines nächsten der Elemente geschnitten und geformt; und
eine Elementenkontaktstelle wird entlang einer Länge des Elements in Kontakt mit der Platte derart positioniert, daß das Element in einem Winkel zu der Platte und von einander gegenüberliegenden Oberflächen vor oder nach dem Schneidschritt sich erstreckt.

3. Verfahren nach Anspruch 1 oder 2, **gekennzeichnet durch den Schritt**, bei dem der Kontakt zwischen der Elementenkontaktstelle und der Platte (1) an einem seitlichen Rand (7) der Platte bewirkt wird.
4. Verfahren nach Anspruch 1 und/oder 2, **gekennzeichnet durch folgende Schritte:**
 - eine Aussparung wird durch die Platte hindurch vorgesehen; und
 - der Kontakt zwischen der Elementenkontaktstelle und der Platte wird an einem seitlichen Rand der Aussparung bewirkt.
5. Verfahren nach Anspruch 1 - 4, **gekennzeichnet durch den Schritt**, bei dem ein elektrischer Strom (8, 9, 10) durch das Element und die Platte an der Kontaktstelle hindurchgeleitet wird, um das Schweißen zu bewirken.
6. Nagelverbinder, mit einer Platte (1) und zumindest einem langgestreckten Element (5), das an der Platte (1) befestigt ist, wie nach Anspruch 1 oder 2 hergestellt, **dadurch gekennzeichnet**, daß zumindest ein langgestrecktes Element (5) an einer Stelle zwischen seinen Enden an einem Rand der Platte (1) angeordnet ist, wobei das Ende oder jedes Ende des langgestreckten Elements (5) asymmetrisch abgeschrägt ist.

Revendications

1. Procédé pour la fabrication d'un dispositif de raccordement à clous, comprenant une plaque (1) et au moins un élément allongé (5) fixé à ladite plaque (1) et faisant saillie à partir de celle-ci, en soudant ledit élément (5) et ladite plaque (1) l'un à l'autre à un point de contact en chauffant ledit élément et ladite plaque suffisamment pour effectuer la fusion de leurs matériaux audit point de contact, dans lequel ladite plaque (1) est réalisée à partir d'un

matériau en plaque, caractérisé par les étapes consistant à :

- amener une bande dudit matériau en plaque vers une station de soudage (9) à laquelle ledit soudage est effectué ;
 espacer une pluralité desdits éléments (5) le long d'une longueur de ladite bande, et en contact avec celle-ci, tout en positionnant un point de contact d'élément, le long d'une longueur dudit élément, en contact avec ladite plaque de sorte que ledit élément s'étende selon un angle par rapport à ladite plaque et à partir des surfaces opposées de celle-ci ; et
 couper (18) ladite bande pour définir une longueur de ladite plaque. 5 10 15
2. Procédé pour la fabrication d'un dispositif de raccordement à clous comprenant une plaque (1) et au moins un élément allongé (5) fixé à ladite plaque (1), et faisant saillie à partir de celle-ci, en soudant ledit élément (5) et ladite plaque (1) l'un à l'autre à un point de contact en chauffant ledit élément et ladite plaque suffisamment pour effectuer la fusion de leurs matériaux audit point de contact, caractérisé par les étapes consistant à : 20 25
- amener au moins un fil (11) du matériau d'élément à partir duquel une pluralité desdits éléments (5) est formée, avec une extrémité avant dudit fil étant une extrémité avant de chaque élément, à son tour ;
 couper (13) et former une extrémité arrière de chacun desdits éléments simultanément avec la coupe et le formage d'une extrémité avant du prochain desdits éléments, et
 positionner un point de contact d'élément, le long d'une longueur dudit élément, en contact avec ladite plaque de sorte que ledit élément s'étende selon un angle par rapport à ladite plaque et à partir des surfaces opposées de celle-ci, avant ou après ladite étape de coupe. 30 35 40
3. Procédé selon la revendication 1 ou 2, caractérisé par l'étape consistant à effectuer ledit contact entre ledit point de contact de l'élément (5) et ladite plaque (1) à un bord latéral (7) de ladite plaque. 45
4. Procédé selon la revendication 1 et/ou 2, caractérisé par les étapes consistant à : 50
- prévoir un renforcement à travers ladite plaque ; et
 effectuer ledit contact entre ledit point de contact de l'élément et ladite plaque à un bord latéral dudit renforcement. 55
5. Procédé selon l'une quelconque des revendications 1 à 4, caractérisé par l'étape consistant à passer un

courant électrique (8, 9, 10) à travers ledit élément et ladite plaque audit point de contact afin d'effectuer ladite soudure.

6. Dispositif de raccordement à clous comprenant une plaque (1) et au moins un élément allongé (5) fixé à ladite plaque (1), tel que fabriqué selon la revendication 1 ou 2, caractérisé en ce qu'au moins un élément allongé (5) est placé à un point entre ses extrémités contre un bord de la plaque (1), dans lequel l'extrémité ou chaque extrémité de l'élément allongé (5) est biseautée de manière asymétrique.

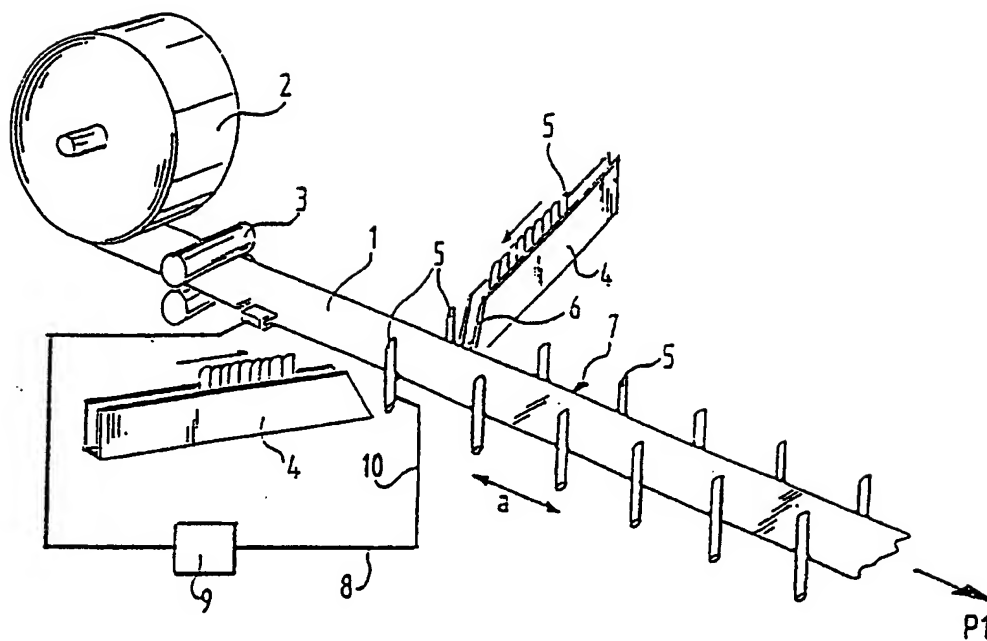


FIG. 1

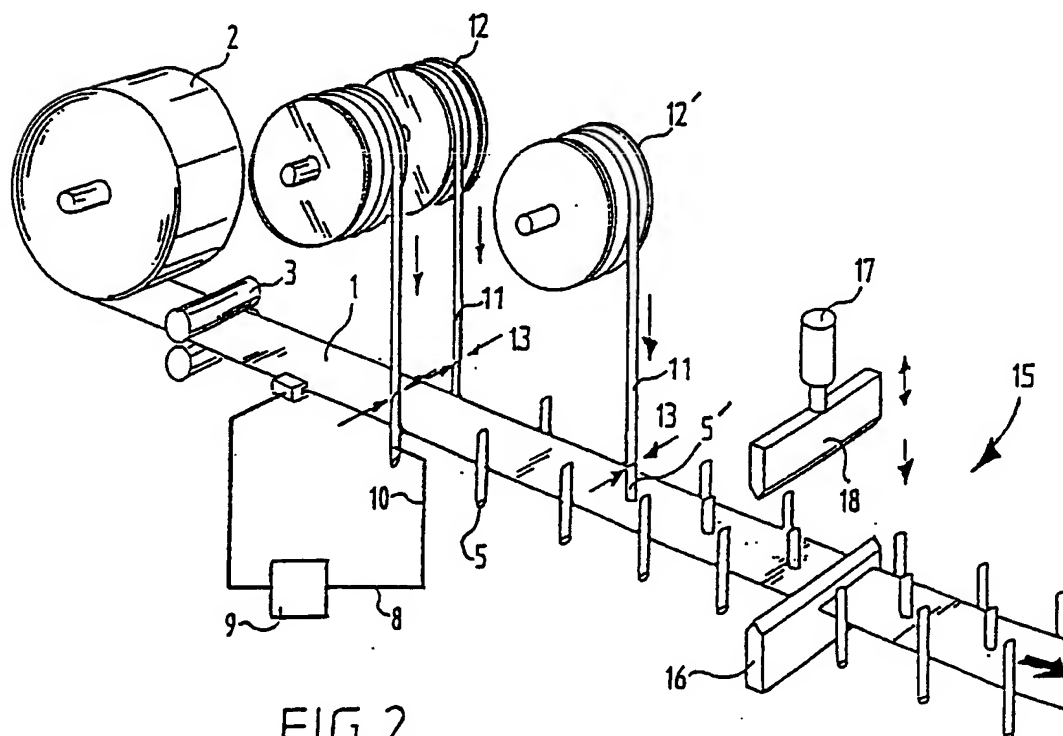


FIG. 2